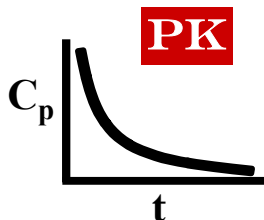
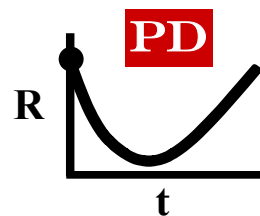


# PHARMACOKINETIC-PHARMACODYNAMIC



## MODELING

### Concepts and Applications



### COURSE OUTLINE

Over the past decade, significant progress has been made in the theory and applications of *pharmacodynamics*. On the basis of diverse *pharmacokinetic-pharmacodynamic modeling* concepts it has become possible to describe and predict the time course of drug effects under physiological and pathological conditions. The study of pharmacokinetic-pharmacodynamic relationships can be of considerable value in understanding drug action, summarizing extensive data, finding optimal dosing regimens, and in making predictions under new circumstances. Not surprisingly, pharmacokinetic-pharmacodynamic modeling concepts are increasingly applied in both basic research as well as in drug development.

This course will deal with the theoretical aspects and with the applications of pharmacokinetic and pharmacodynamic modeling. Subjects that will be discussed include:

- Basic pharmacodynamic theory:** receptor binding, post-receptor events, concentration-effect-time relationships.
- Pharmacokinetic complexities:** e.g. the role of distribution, metabolites, protein binding, the implications for the design of *in vivo* pharmacodynamic investigations; use of biomarkers and surrogate responses, models for pharmacogenomics;
- Biophase compartment modeling:** parametric, semi-parametric and non-parametric approaches;
- Physiological pharmacodynamic modeling:** indirect response models, cell lifespan models, chemotherapeutic effects;
- Pharmacodynamic drug-drug interactions:** isobolograms, competitive and non-competitive interactions;
- Functional tolerance development:** desensitization, counter-regulation, physiological feedback, indirect precursor models;
- Population pharmacodynamics:** application of NONMEM in pharmacodynamics, issues in use of covariates.
- Specific drug applications:** CNS active agents, cardiovascular agents, corticosteroids, anticoagulants, antibodies, antibiotics.
- Special topics:** Signal transduction, circadian rhythms, target-mediated PK/PD models, disease progression models.

### COURSE DIRECTION

**William J. Jusko, PhD**

Dr. Jusko is Professor and Chair of Pharmaceutical Sciences at the School of Pharmacy and Pharmaceutical Sciences at the University of Buffalo. Dr. Jusko supervises a research program on the pharmacokinetics and pharmacodynamics of immunosuppressive drugs such as corticosteroids, tacrolimus and sirolimus and holds three NIH grants in areas such as corticosteroid PK/PD, mathematical modeling, and biomedical computation. He has authored over 460 publications, consults for the FDA, NIH, and the pharmaceutical industry, and is listed in ISI Most Highly Cited in Pharmacology.



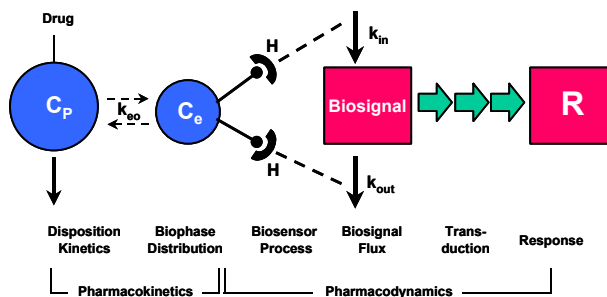
William J. Jusko, PhD

#### Ancillary Course A

May 18-20, 2006

Population PK/PD Modeling:  
Introduction to NONMEM®

A "hands on"  
computer tutorial.



**UB University at Buffalo**  
The State University of New York at Buffalo  
School of Pharmacy and Pharmaceutical Sciences

#### Ancillary Course B

May 25-26, 2006

Use of WinNonlin for  
PK/PD Modeling

A "hands on"  
computer tutorial.



# COURSE PROGRAM

<b>May 21</b>	<b>Sunday</b>		
6:30-7:00	Registration/Reception	10:00-11:00	Dr. W.J. Jusko: <b>Modeling Irreversible Effects</b>
7:00-8:00	Dr. W.J. Jusko: <b>History &amp; Highlights</b>	11:00-12:00	Dr. A. Forrest: <b>Modeling Chemotherapeutic Effects</b>
8:00-9:30	Dinner	12:00-01:00	Lunch
		01:00-02:00	Dr. W.J. Jusko: <b>Modeling Functional Adaptation</b>
<b>May 22</b>	<b>Monday</b>	02:00-03:00	Dr. W.J. Jusko: <b>Modeling Transduction Processes</b>
08:00	Continental Breakfast	03:00-03:15	Refreshments
08:30-08:45	Dr. W.J. Jusko: <b>Introductions</b>	03:15-04:15	Dr. D. Mager: <b>Target-Mediated PK/PD Models</b>
08:45-09:45	Dr. W.J. Jusko: <b>Basic Pharmacologic Theory</b>	04:15-05:15	Dr. W.J. Jusko: <b>Modeling Drug Interactions</b>
09:45-10:45	Dr. D. Mager: <b>Kinetics of Pharmacologic Effects</b>		
10:45-11:00	Coffee	<b>May 24</b>	<b>Wednesday</b>
11:00-12:00	Dr. W.J. Jusko: <b>Modeling Biophase Distribution</b>	08:00	Continental Breakfast
12:00-01:00	Lunch	08:30-09:45	Dr. W.J. Jusko: <b>Review &amp; Exercises II</b>
01:00-02:00	Dr. W.J. Jusko: <b>Basic Indirect Response Models</b>	09:45-10:00	Coffee
02:00-03:00	Dr. W. Krzyzanski: <b>Cell Lifespan Models</b>	10:00-11:00	Dr. J. Balthasar: <b>Monoclonal Antibodies</b>
03:00-03:30	Break	11:00-12:00	Dr. W.J. Jusko: <b>Animal Scaling in PK/PD</b>
03:30-04:30	Dr. W.J. Jusko: <b>Complexities of Indirect Responses</b>	12:00-01:00	Lunch
		01:00-02:00	Dr. W.J. Jusko: <b>Disease Progression Models</b>
<b>May 23</b>	<b>Tuesday</b>	02:00-03:00	Pf. J. Fiedler-Kelly: <b>Population PK/PD Models</b>
08:00	Continental Breakfast	03:00-03:15	Refreshments
08:30-09:45	Dr. D. Mager: <b>Review &amp; Exercises I</b>	03:15-04:15	Dr. W.J. Jusko: <b>Computational Issues in PK/PD</b>
09:45-10:00	Coffee	04:15-05:15	Dr. W.J. Jusko: <b>Final Discussion and Summary</b>

## REGISTRATION INFORMATION

**Course location:** The course will be held at the University Inn & Conference Center, 2401 N. Forest Road, Amherst, New York 14226-0823, U.S.A. Phone: (716) 636-7500. Fax: (716) 636-8296.

The Conference Center is 15 min. from Buffalo International Airport. The price is \$68/day. **Hotel Deadline: April 21, 2006.**

**Fee:** Individual fee: \$2000. This includes course documentation, mid-session refreshments, lunches and opening dinner during the course. Up to 5 graduate students may enroll at a fee of \$1000. US Government rate: \$1500.

**Registration:** Please register ASAP in view of the limited course capacity of 36 participants. Confirmation of registration will be returned upon receipt, together with an invoice for the course fee. Registration will not be final until payment is received.

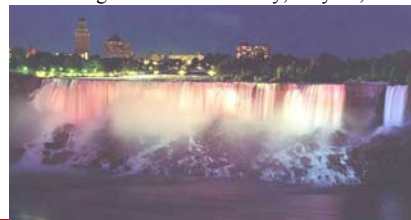
**Cancellations:** Cancellations with a full refund may be made until March 31, 2006. No refund is possible on cancellations received after this date. Substitutions may be made at any time.

**Payment:** University at Buffalo Foundation Inc. Bank transfers and credit card payments are accepted as well as checks.

**Ancillary WinNonlin Course:** This course will be followed by an optional 2-day hands-on tutorial course in "Use of WinNonlin for PK/PD Modeling" with primary instruction by Dr. Daniel Weiner from PharSight. This course will utilize the Computer Laboratory at The University at Buffalo. An additional fee of \$1000 is required (Govt. \$800, Students \$500).

**Ancillary NONMEM® Course:** An optional 3-day hands-on tutorial course in "Population PK Data Analysis using NONMEM®" will be provided by Prof. Jill Fiedler-Kelly from Cognigen and Alan Forrest from UB. An additional fee of \$2000 is required (Govt. \$1500, Students \$1000).

**Niagara Excursion:** Cognigen Corporation will sponsor a bus trip to Niagara Casino and Niagara Falls on Monday, May 22, at 5:30 PM.



**REGISTRATION FORM: Pharmacokinetic-Pharmacodynamic Modeling, May 21-24, 2006. WinNonlin, May 25-26, 2006. NONMEM®, May 18-20, 2006.**

Name \_\_\_\_\_ Title \_\_\_\_\_ Organization \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State/Country \_\_\_\_\_ Postal Code \_\_\_\_\_  
 Telephone \_\_\_\_\_ Fax \_\_\_\_\_ Email \_\_\_\_\_

Opening Reception/Dinner, Sunday, May 21, 6:30 PM: \_\_\_\_\_ Will Attend \_\_\_\_\_ Will Not Attend \_\_\_\_\_ Vegetarian Meal Requested \_\_\_\_\_  
 Excursion to Niagara Falls, Monday, May 22, 5:30 PM: \_\_\_\_\_ Will Attend \_\_\_\_\_ Will Not Attend \_\_\_\_\_  
 WinNonlin Course on PK/PD Modeling : \_\_\_\_\_ Will Attend \_\_\_\_\_ Will Not Attend \_\_\_\_\_  
 Population PK (NONMEM®) Course: \_\_\_\_\_ Will Attend \_\_\_\_\_ Will Not Attend \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

Please return to: PK/PD MODELING, Department of Pharmaceutical Sciences, School of Pharmacy, State University of New York at Buffalo, 519 Hochstetter Hall, Buffalo, NY 14260; phone: (716) 645-2842, ext. 225; fax: (716) 645-3693; Email: wj Jusko@buffalo.edu